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FOR PUNJAB CLASS 12 PREPARATION

PSEB 12th Sample Paper 2027 Chemistry

EXAM	YEAR	TYPE	SUBJECT
Punjab Class 12	2027	Sample Paper	Chemistry

CLASS XII CHEMISTRY (2026-27) (Model test paper)

Time: 3 Hours **Maximum Marks: 70**

There will be one theory paper comprising of 21 questions. All questions are compulsory.

Question no. 1 will have 18 sub parts and each part will carry 1 mark. All questions are compulsory.

Question no. 2 to 13 will be of two marks each. There will be internal choice in three questions. All questions are compulsory.

Question no.14 to 19 will be of three marks each. There will be internal choice in two questions. All questions are compulsory

Question no.20 to 21will be of five marks each. There will be internal choice in them.

1.

I. The bends occur because a scuba diver ascends rapidly, causing
(a)Oxygen forms bubbles in blood
(b). Nitrogen dissolved in the blood to come out of solution due to reduced pressure
(c) Carbon dioxide accumulates in lungs
(d) Hydrogen dissolves in blood

II. A solution has a freezing point of –2°C while pure water freezes at 0°C.
The depression in freezing point is (a) 2°C (b) 0°C (c) 4°C (d) –2°C

III. The conductance of a solution is 0.02 S and its conductivity is 0.01 S cm^{-1}.
The cell constant is: (a) 0.5 cm^{-1} (b) 10 cm^{-1} (c) 5.0 cm^{-1} (d) 2.0 cm^{-1}

IV. The unit of rate constant for a first-order reaction is:
(a) mol L^{-1} s^{-1} (b) L mol^{-1} s^{-1} (c) s^{-1} (d) mol^{2} L^{-2} s^{-1}

V. A student observes that a solution of $CuSO_4$ is blue, whereas $ZnSO_4$ solution is colourless. The best explanation is:
(a)Copper is heavier than zinc.
(b) Cu^{2+} has partially filled d-orbitals, whereas Zn^{2+} has a completely filled d^{10} configuration.
(c) Copper has a higher melting point.
(d) Zinc does not dissolve in water.

VI. A ligand that donates only one lone pair to the central metal atom is called:
(a) Bidentate ligand
(b) Monodentate ligand
(c) Ambidentate ligand
(d) Polydentate ligand

VII. An industry uses EDTA during water treatment to remove Ca^{2+} and Mg^{2+} ions.
EDTA is effective because it: (a) Increases water hardness
(b) Precipitates all salts
(c)Oxidises metal ions
(d) Forms stable chelate complexes with metal ions

VIII. Haloalkanes are generally insoluble in water because they:
(a)Have very low molecular masses. (b) React immediately with water.
(c) Are ionic compounds. (d) Cannot form strong hydrogen bonds with water molecules.

IX. A chemical industry uses NaI in dry acetone to convert alkyl chlorides into alkyl iodides.
This reaction is called:
(a) Sandmeyer reaction
(b) Finkelstein reaction
(c) Wurtz reaction
(d) Friedel–Crafts reaction

X. The major product obtained when phenol reacts with bromine water is:
(a) Bromobenzene
(b) Benzoic acid
(c) 2,4,6-Tribromophenol
(d) 2-Bromophenol

XI. Arrange them in increasing order of boiling point.
(a) Propane < Ethanol < Diethyl ether
(b) Ethanol < Diethyl ether < Propane
(c) Diethyl ether < Propane < Ethanol
(d) Propane < Diethyl ether < Ethanol

XII. Aldehydes are generally more reactive than ketones towards nucleophilic addition because:
(a) Aldehydes contain fewer carbon atoms.
(b) They have less steric hindrance and a more electrophilic carbonyl carbon.
(c) Ketones are ionic compounds.
(d) Ketones contain oxygen atoms.

XIII. Which compound is commonly used as a nail polish(earlier use) remover?
(a) Benzaldehyde
(b) Acetone
(c) Ethanoic acid
(d) Methanal

XIV. Complete the Reaction
$CH_3COOH + SOCl_2 \rightarrow ?$
(a) CH_3CHO
(b) CH_4
(c) $CH_3COCl + SO_2 + HCl$
(d) CH_3OH

XV. Which nucleic acid directly carries genetic information from DNA to ribosomes?

(a) rRNA
(b) mRNA
(c) tRNA
(d) DNA

XVI. Which of the following compounds gives a positive Hinsberg test but is insoluble in alkali after reaction?

(a) Ammonia
(b) Primary amine
(c) Secondary amine
(d) Tertiary amine

Assertion–Reason Assertion

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, but R is not the correct explanation of A.
C. A is true, but R is false.
D. A is false, but R is true.

XVII. (A): A solution of NaCl shows a greater elevation in boiling point than an equimolar glucose solution.
Reason (R): NaCl dissociates into ions, increasing the number of solute particles.

XVIII. Assertion (A): Zn^{2+} ions are colourless.
Reason (R): Zn^{2+} has a completely filled $3d^{10}$ configuration.

SECTION-B QUESTIONS CARRYING TWO MARKS

2. Differentiate between Ideal solution and Non-ideal solutions.
3. The boiling point of benzene is 353.23K. When 1.80g of a non-volatile non-ionisation solute was dissolved in 90g of benzene, the boiling point raised to 354.11K. Calculate the molar mass of the solute. [K_b for benzene =2.53K Kg mol^{-1}].
   Or
   Calculate the molar concentration of urea solution if it exerts an osmotic pressure of 2.45 atm at 300K [R=0.082 L atm^{-1} K^{-1}].
4. The molar conductance of infinite dilution for sodium acetate (CH_3COONa), Hydrochloric acid (HCl) and sodium chloride (NaCl) are 95.5, 426.9 and 120.4 S cm^2mol^{-1} respectively at 298 K. Calculate the molar conductance of Acetic Acid (CH_3COOH) at infinite dilution.
5. Why does the molar conductivity of a weak electrolyte increase sharply on dilution?
6. A first order reaction is found to have rate constant, k=5.5 x 10^{-14} s^{-1}. Find half-life period of reaction.
   Or
   State the order of reaction and units of rate constant:
   $2NOBr(g) \text{-------} \rightarrow 2NO(g) + Br_2(g)$ $r= k[NOBr]^2$

7. Write the Arrhenius equation for different temperature. Explain the significance of each term in the equation.
8. Transition metals have high melting points and boiling points. Why ?
9. Write the IUPAC Name the following complexes: (i) $K[PtCl_3(NH_3)]$ (ii) $[Pt(NH_3)_2Cl_4]$
10. Write short note on coupling reaction.

Or

Why primary alcohols are more acidic than secondary alcohols ?

11. Give one test to distinguish between acetophenone and Benzophenone.
12. Write difference between DNA and RNA.
13. Write short note on Gabriel Phthalimide synthesis.

SECTION-C QUESTIONS CARRYING THREE MARKS

14. Write Nernst equation and calculate EMF of cell:

Cu/Cu^{+2} (0.130M)// Ag^{+1}(1x10^{-4}M)/Ag given $E^o_{Ag^{+1}/Ag}$=+0.80V, $E^o_{Cu^{+2}/Cu}$=0.34V

Or

A cell reaction is Sn (s)/ $Sn^{2+}_{(0.50M)}$ // $H^{+}_{(0.020M)}$ / $H_2(g)$. Calculate E_{cell} of a reaction and also write Nernst equation.

Given : $E^o\ (Sn^{2+}/Sn)$ = – 0.14 V and $E^o\ (H^{1+}|H)$ = 0.00 V.

15. (a) Why is C – O – C bond angle in ether is more than H – O – H bond angle in water though oxygen atom is sp^3 hybridised in both the cases ?

(b) Discuss equation of reactions for the preparation of phenol from Cumene.

Or

Write the Victor meyer's test to distinguish between 1°, 2° and 3° alcohols

16. Write the Hinsberg test to distinguish between primary,secondary and tertiary amines.
17. Explain difference between Weak field ligand and Strong field ligand.
18. (a)Why is chloroform stored in dark coloured bottles ?

(b) Complete the following reaction ?

(i) $CH_3CH_2Br + KOH\,(aq) \longrightarrow$ (ii) $CH_3CH_2Br + KCN \longrightarrow$

19. A company manufactures fruit jam containing a high concentration of sugar. The jam remains safe to eat for a long period when stored properly.

Questions

(a) Why is a large amount of artificial sweetener added to jam? (1)

(b) Which class of biomolecules does sugar belong to? (1)

(c) Name one reducing sugar commonly present in fruits. (1)

SECTION-D QUESTIONS CARRYING FIVE MARKS

20. (a)what is lanthanoid contraction? give its cause. Give three consequences of lanthanoid contraction.

OR

(a) Why Zn^{2+} salts are white while Cu^{2+} salts are blue?

(b) Why is +2 oxidation state of manganese more stable than its +3 oxidation state?

(c) Why Cu is considered as transition metal? (2+2+1)

21. Explain the following reactions:

(i)(a) Balz-Schiemann reaction (b) Gattermann reaction (c) Ullmann reaction

(ii) Complete the following conversions.

(a) Chlorobenzene → Phenol

(b) Ethyl chloride → Ethene

(1X5=5)

Or

(a) Give three differences between SN^1 and SN^2 reactions?

(b) Why aryl halide(haloarenes) are less reactive than alkyl halide(haloalkanes) ?

(3+2)